

Name: _____ Date: _____

Polynomial Factoring solution (version 680)

1. The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.

$$x^2 - 12x + 60 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(60)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 240}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-96}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{12 \pm 4\sqrt{6}i}{2}$$

$$x = 6 \pm 2\sqrt{6}i$$

Notice that i is NOT under the square-root radical symbol!!

2. Express the product of $6 + 7i$ and $3 - 2i$ in standard form $(a + bi)$.

Solution

$$(6 + 7i) \cdot (3 - 2i)$$

$$18 - 12i + 21i - 14i^2$$

$$18 - 12i + 21i + 14$$

$$18 + 14 - 12i + 21i$$

$$32 + 9i$$

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3. Write function $f(x) = x^3 + 7x^2 - 6x - 72$ in factored form. I'll give you a hint: one factor is $(x - 3)$.

Solution

$$\begin{array}{c|cccc} & 1 & 7 & -6 & -72 \\ 3 & & 3 & 30 & 72 \\ \hline & 1 & 10 & 24 & 0 \end{array}$$

$$f(x) = (x - 3)(x^2 + 10x + 24)$$

$$f(x) = (x - 3)(x + 6)(x + 4)$$

4. Polynomial p is defined below in factored form.

$$p(x) = -(x + 2) \cdot (x - 2)^2 \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.

